

Title: Alterations in the maize transcriptome upon infestation by southern corn rootworm

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Abstract:

Many studies have characterized the transcriptome of plants attacked by herbivorous insect pests. In general, the nature of the assault dictates the plant response. For example, chewing insects create a jasmonic acid (JA) mediated response, while sucking/piercing insects lead to a salicylic acid (SA) mediated response. However, few studies have examined a belowground assault by root infesting insects. We have subjected maize seedlings to the larvae of southern corn rootworm (SCR) *Diabrotica undecimpunctata howardi*. These larvae are chewing insects that burrow into and destroy maize roots. Using a 57,000 oligo maize microarray we have identified genes that are differentially expressed upon root infestation by SCR. A comparison of the genes induced and repressed in the infested roots suggests a massive reprogramming from growth and development to defense. A subset of the SCR induced genes were further examined using qRT-PCR, for confirmation of the induction by SCR feeding. Additional experiments determined whether this subset of SCR induced genes were preferentially responsive to JA or SA. The evidence suggests that SA- and JA-dependent and independent signaling could be contributing to the transcriptome-level changes to maize roots and shoots in response to SCR infestation.